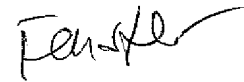


From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
PRELIMINARY REPORT ON PATENTABILITY
(CHAPTER I OF THE PATENT COOPERATION
TREATY)
(PCT Rule 44bis.1(c))

To:



DIPPERT, William, H.
Wolf, Block, Schorr & Solis-Cohen LLP
250 Park Avenue
New York, New York 10177
ETATS-UNIS D'AMERIQUE

Date of mailing (*day/month/year*)
21 June 2007 (21.06.2007)

Applicant's or agent's file reference
015/04972 34446

IMPORTANT NOTICE

International application No.
PCT/US2005/044557

International filing date (*day/month/year*)
09 December 2005 (09.12.2005)

Priority date (*day/month/year*)
09 December 2004 (09.12.2004)

Applicant

IMPULSE DYNAMICS (ISRAEL), LTD. et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Dorothee Mülhausen

Facsimile No. +41 22 338 82 70

e-mail: pct@wipo.int

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 015/04972	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2005/044557	International filing date (<i>day/month/year</i>) 09 December 2005 (09.12.2005)	Priority date (<i>day/month/year</i>) 09 December 2004 (09.12.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant IMPULSE DYNAMICS (ISRAEL), LTD.		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 7 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Date of issuance of this report 13 June 2007 (13.06.2007)</td> </tr> <tr> <td style="padding: 5px;">Authorized officer <div style="text-align: center; font-weight: bold;">Dorothee Mülhausen</div></td> </tr> <tr> <td style="padding: 5px;">e-mail: pt01.pct@wipo.int</td> </tr> </table>	Date of issuance of this report 13 June 2007 (13.06.2007)	Authorized officer <div style="text-align: center; font-weight: bold;">Dorothee Mülhausen</div>	e-mail: pt01.pct@wipo.int
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Authorized officer <div style="text-align: center; font-weight: bold;">Dorothee Mülhausen</div>				
e-mail: pt01.pct@wipo.int				

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 15 MAY 2006

To:
WILLIAM H. DIPPERT
WOLF, BLOCK, SCHORR & SOLIS-COHEN LLP
250 PARK AVENUE
NEW YORK, NY 10177

WIPO PCT
PCT MAY 2006
WIPO PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference

015/04972

Date of mailing
(day/month/year)

12 MAY 2006

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US05/44557

International filing date (day/month/year)

09 December 2005 (09.12.2005)

Priority date (day/month/year)

05 May 2005 (05.05.2005)

International Patent Classification (IPC) or both national classification and IPC

IPC: A61N 1/00(2006.01);A61N 1/32(2006.01);C12N 13/00(2006.01);C12N 5/00(2006.01)
USPC: 607/2,50;435/173.1,375

Applicant

IMPULSE DYNAMICS (ISRAEL), LTD.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Date of completion of this opinion

28 April 2006 (28.04.2006)

Authorized officer

For Robert E Pezzuto

Telephone No. 571-272-3700

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US05/44557

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/44557

Box No. V Reasoned statement under Rule 43 *bis.1(a)(i)* with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 79 YES
Claims 1-78 and 80-154 NO

Inventive step (IS)

Claims NONE YES
Claims 1-154 NO

Industrial applicability (IA)

Claims 1-154 YES
Claims NONE NO

2. Citations and explanations:

Please See Continuation Sheet.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/44557

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claim 46 objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: The claim lacks reference to the claim from which it depends. The claims states "a method according to", but does not specify from which claim it depends.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/44557

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-76, 81-90, 97-133, and 149-154 lack novelty under PCT Article 33(2) as being anticipated by Donovan et al. (U.S. Patent No. 6,810,286), herein Donovan.

Regarding claims 1-74, 81-90, 97-120, 129, 130, and 149-154, Donovan discloses a stimulation device which applies an electric field to the heart of a patient in order to modify the activity of cardiac proteins and treat conditions such as coronary artery disease and ischemia (see col. 2, ln. 19-26). The device includes at least one electrode 3 applied to in vivo tissue and a controller 1 to control delivery of stimulation to the tissue (see Figure 1). It is inherent that the modified proteins are not sensitive to physiologically occurring inter-cellular electric fields, otherwise the electrical therapy would be unnecessary. The electrical energy applied by Donovan acts to enhance angiogenesis in order to repair the heart and ensure that oxygen is adequately supplied to the body. Donovan discloses that the electrical energy is applied at a subthreshold level in order to prevent excitation of the heart tissue (see col. 2, ln. 27-28). The method taught by Donovan is inherently capable of being applied to any number of tissue forms, including a tissue sample, in vivo tissue, separated cells, and tissue homogenate. Further, Donovan discloses programming the device to apply stimulation at a level which produces a desired effect and measuring the effect the stimulation has on the tissue sample (see Claim 28).

Regarding claims 75 and 76, the pulse sequence delivered by Donovan is chosen in order to have the greatest effect on the desired protein activity modification to treat coronary artery disease and the controller is programmed to carry out the prescribed stimulation parameters (see col. 9, ln. 23-44).

Regarding claims 121-123 and 128, it is inherent within the method of Donovan that when the electrodes are placed on the heart of the patient, either transvenously or non-transvenously, a testing procedure must be enlisted in order to ensure that the placement of the electrodes is suitable for applying the desired stimulation.

Regarding claims 124-127 and 131-133, Donovan discloses that the therapy is applied to the heart of the patient and the location of the stimulation is based on the desired effect of the stimulation therapy (see col. 9, ln. 9-17). Further, Donovan discloses that the stimulation therapy may be applied in order to treat ischemia (see col. 1, ln. 32-33).

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US05/44557

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Claims 77, 78, and 80 lack novelty under PCT Article 33(2) as being anticipated by Girouard et al. (U.S. 2004/0158289), herein Girouard. Girouard discloses a method for conditioning living tissue through electrical therapy which includes providing tissue samples (plugs), applying an electric field to the samples, and implanting the samples into a patient (see paragraph 74). Further, the tissue utilized by the Girouard is disclosed to be cardiac tissue (see paragraph 39, ln. 1-6). The cell therapy which is administered to the tissue in block 110 constitutes genetic modification of the tissue being treated (see Figures 1 and 2).

Claims 91-96, and 134-148 lack novelty under PCT Article 33(2) as being anticipated by Ladner et al. (U.S. Patent No. 5,962,246), herein Ladner. Ladner discloses a biochemical assaying kit for determining biochemical activity in relation to biochemical markers associated with genes, which includes an indicator of protein phosphorylation (see col. 12, ln. 58-60). The kit of Ladner is disclosed to be used to determine the changes in the proliferation status of a tissue due to various stimuli, including electrical stimulation (see col. 12, ln. 8-11 and 50-51), therefore it is inherent that the kit includes instructions for using phosphorylation as an indicator of tissue state. Further, Ladner discloses indicators for protein or mRNA expression levels (see col. 15, ln. 43-58).

Claim 79 lacks an inventive step under PCT Article 33(3) as being obvious over Girouard. Girouard discloses the claimed invention except for the excision of the plugs from a same heart into which they are later implanted. However, it is well known in the field of tissue engineering to explant a tissue plug from a patient, treat it either through electrical stimulation or drug therapy, and re-implant it into its original location.

Claims 1-154 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.